APPENDIX F MISCELLANEOUS GUIDELINES AND INSTRUCTIONS

The following forms are specified in individual chapters. Unless noted, electronic NASA and JSC forms are available via forms search at URL: https://nef.nasa.gov/

The attachments in this appendix are related to individual chapters and provide additional guidelines or instructions. The attachment number is the corresponding chapter number and the letters designate the order of attachments for that chapter. For example, Attachment 2.7A is the first attachment related to chapter 2.7. Attachment 2.7B is the second attachment related to chapter 2.7.

Attachment 1.1A, Records, Documentation, and Reports

1.0 CENTER-LEVEL SAFETY AND HEALTH RECORDS

JSC must keep the records described in the following table. Records are kept in a central location for easy access, and many records have backup copies stored at a federal records retention center. JSC must keep records back to the beginning of the fiscal year of the last OSHA VPP review or longer if required by OSHA or NRRS 1441.1, "Records Retention Schedules." Any format that includes the pertinent information is acceptable unless otherwise noted in the table. JSC must protect all safety and health records under the Privacy Act of 1974.

Record . . .	***Chap-ter***	***NRRS # . . .***	***Retention***	***Custodian & Other requirements . . .***
JSC Management Council minutes to document safety decisions	1.1	1700, 117.5	Handle as permanent	JSC Management Council keeps minutes
Contractor Safety Forum minutes	1.1	1700, 117.5	Handle as permanent	Contractor Safety Forum keeps minutes
Tracking completion of tasks assigned by JSC Management Council or Contractor Safety Forum	1.1	1700, 117.5	Handle as permanent	JSC Management Council and Contractor Safety Forum keep tracking
Tracking completion of Center-level goals	1.1	1700, 117.5	Handle as permanent	Safety and Test Operations Division keeps tracking
A commitment statement from the current Director, JSC	1.1	1700, 117.5	Handle as permanent	Safety and Test Operations Division keeps; within 60 days after a change of Center Director, a new statement must be sent to OSHA
A letter of support for VPP signed by the current president, AFGE, local 2284	1.1	1700, 117.5	Handle as permanent	Safety and Test Operations Division keeps; within 60 days after a change in either the president, AFGE local 2284, or Director, JSC, a new letter must be sent to OSHA
JPR 1700.1 and change records	1.3	1700, 125	10 years or when superseded or obsolete	Safety and Test Operations Division keeps document and change records
Waiver documentation for both center-level and higher-level waivers	1.1	1700, 117.5	Handle as permanent	Safety and Test Operations Division keeps until the waiver expires; yearly summary must be sent to NASA HQ, S&MA, of any waivers JSC approves to NASA-level requirements
Center-level financial records showing safety items	1.2	1700, 117.5	Handle as permanent	The Office of the Chief Financial Officer and the Center Operations Directorate keep financial records

Records on JSC contractors to include: Contractor OSHA Form 300, "OSHA Log and Summary of Occupational Injuries and Illnesses," logs and supporting information, documentation on contractor selection that shows safety and health was considered in selecting the contractor Documentation showing contractor evaluation that includes safety and health Disciplinary action taken on a contractor because of safety and health reasons Any other safety and health documentation required by an individual contract such as safety and health plans	1.5	1700, 117.5	Handle as permanent	Safety and Test Operations Division keeps current logs. OSHA Form 300 in the format required by OSHA Office of Procurement keeps all other records in format that includes the pertinent information
JSAT minutes	1.6	1700, 117.5	Handle as permanent	JSAT keeps the minutes
Safety and health program self-evaluation	1.7	1700, 117.5	Handle as permanent	Safety and Test Operations Division keeps the self-evaluation, format As required by OSHA VPP Region VI
Documentation on tracking self-evaluation actions to closure	1.7	1700, 117.5	Handle as permanent	Safety and Test Operations Division keeps documentation
Information for NASA's annual report to OSHA	1.7	1700, 120	Retire to FRC when inactive. Destroy when 12 years old	The Safety and Test Operations Division will send its information for this report to NASA Headquarters when Headquarters requests it. This must include documentation required by NPR 8715.1 and NPR 8715.3
Safety and Health design comments	2.1	1700, 117.5	Handle as permanent	The Safety and Test Operations Division keeps safety comments; the Space Medicine Operations Division keeps health comments
Design review documentation and acceptance test and inspection records	2.1	1700, 117.5	Handle as permanent	COD keeps the records
Operational Readiness Inspection reports and records	2.1 & 10. 3	1700, 117.5	Handle as permanent	The Safety and Test Operations Division keeps the reports and records indefinitely
Records of the NEPA environmental reviews	2.1	8800, 43	Destroy when 5 years old	Environmental Office keeps the records

Industrial hygiene records – sampling and analysis	2.2	1840	Contact Center Records Manager	Space Medicine Operations Division keeps records
Records on annual Safety and Test Operations Division safety inspections	2.4	1700, 117	Retire to FRC when related property is disposed of by NASA. Destroy 5 years after disposal	The Safety and Test Operations Division keeps records of safety inspections; the Space Medicine Operations Division keeps records of health inspections, recorded in the Hazard Abatement Tracking System
Employee reports of hazards and close calls	2.5	1700, 119.5	Handle as permanent	Safety and Test Operations Division keeps these records, recorded in tracking databases
Log of occupational injuries and illnesses This log records federal employee job-related injuries and illnesses that are OSHA reportable	2.6	1700, 117.5	Handle as permanent	The Safety and Test Operations Division records the information in SRTS within 1 working day after finding out about the injury or illness. The log must include cases reported to the Office of Workers' Compensation Programs. OSHA Form 300, data stored in databases.
Annual Summary of Federal Occupational Injuries and Illnesses	2.6	1700, 117.5	Handle as permanent	The Safety and Test Operations Division will: Post copies of the summary where employee notices are posted by Feb. 1 – Apr. 30 of each year. OSHA Form 300 Take steps to make sure no one alters, defaces, or covers the copies Send a copy of the summary to NASA Headquarters by October 30 of each year
Mishap board reports and records (including supporting evidence, transcripts, and minutes of board meetings)	2.6	1700, 122	Permanent retire to frc when 2 years old. Transfer to nara when 20 years old	Safety and Test Operations Division keeps records, format per NPR 8621.1
Mishap Reports	2.6	1700, 120	Retire to frc when 2 years old. Destroy when 10 years old	Safety and Test Operations Division keeps reports
Records to support Center-level trend analysis, such as minutes where trends are discussed and committee reports on trends are analyzed	2.7	1700, 117.5	Handle as permanent	Safety and Test Operations Division, Space Medicine Operations Division, JSAT keep records as appropriate

Other OSHA-required records at the Center level (e.g., lockout/tagout audit reports, hearing conservation records)	3.2	1700, 117.5	Handle as permanent	Per OSHA requirements, the Safety and Test Operations Division keeps safety records; Space Medicine Operations Division keeps health records
Chemical inventory to show that JSC doesn't fall under the Process Safety Management Standard	3.3	1840	Contact Center Records Manager	Space Medicine Operations Division keeps inventory
Center-level maintenance schedules, procedures, and records	3.4	1700, 117.5	Handle as permanent	The Center Operations Directorate keeps the schedules, procedures, and records
SHETrack	3.5	1700, 117	Retire to FRC when related property is disposed of by NASA. Destroy 5 years after disposal	The Safety and Test Operations Division keeps the SHETrack database
Employee medical records	3.6	1800, 127	See NPR 1441.1, depends on type of employee	Space Medicine Operations Division keeps these records at the JSC Clinic
Log of federal workers' compensation cases	3.6	1800, 127	See NPR 1441.1, depends on type of employee	Space Medicine Operations Division keeps the log, Form CA-1, CA-2, or CA-6
Training attendance records and course documentation for JSC Safety Learning Center and Space Medicine Operations Division classes	4.1 – 4.3	1700, 117.5	Handle as permanent	The Safety and Test Operations Division keeps records for safety training; the Space Medicine Operations Division keeps records for health training
NRC license records	7.3	8700, 40	Destroy 10 years after expiration or renewal of the license, provided all material procured has been disposed of	Radiation Safety Officer keeps records per NRC requirements
Radiation exposure records	7.3	8700, 39	Destroy when 75 years old	

JSC hazardous material inventory and central repository for MSDSs/SDSs	9.2	1840	Contact Center Records Manager	Space Medicine Operations Division keeps MSDSs/SDSs

2.0 ACCESS TO JSC'S SAFETY AND HEALTH RECORDS AND REPORTS

The following individuals may see JSC records and reports on request:

JSC Management Council, JSAT, employees, former employees, and employee representatives may see JSC logs and yearly summaries.

Authorized representatives from the Department of Labor or Health and Human Services may see any JSC safety and health records or reports.

Any employee is authorized access to their medical and exposure records under OSHA 29 CFR 1910.1020.

3.0 SAFETY AND HEALTH DOCUMENTATION FOR JSC ORGANIZATIONS

JSC managers must maintain the documentation listed in the following table as it applies to the work their organization does. Documentation may be electronic or hard copy. You may consolidate some documentation at higher levels of management, such as directorate or division, as appropriate. As a minimum, you must keep documentation back to the beginning of the fiscal year of the last OSHA VPP review, or longer if required by OSHA or NRRS 1441.1. You are only required to keep a current copy of certain records as indicated in the table. Any format that includes the pertinent information is acceptable unless otherwise noted in the table.

Documentation . . .	***Chapter . . .***	***Remarks***
Organizational safety committee minutes (including construction committee minutes and inspection records as appropriate)	1.1 10.1 for construction	None
Tracking completion of tasks or goals assigned by Directorate Safety Committees or other organization-level committees if assigned	1.1	None
You are encouraged to keep documentation on requirements relief or waivers granted for your organization	1.3	Keep until the waiver expires
Performance plans showing safety and health responsibilities	1.1	Keep current plans only
Performance appraisals that include safety and health	1.4	Keep current appraisals only

Documentation of employee involvement that may include: • Training records that show employees giving or receiving safety and health training • Attendance records for safety and health meetings, especially where employees present safety or health topics • Photographs of employees participating in safety and health activities such as Safety and Total Health Day • Lists of safety and health activities and names • Any other records that show employee involvement in safety and health activities	1.6	None
Design review, ORI, URR, and TRR documentation (hazardous material hazard analyses, other hazard analyses and JHAs – Chapter 2.4 – may also support this element)	2.`	None
Job hazard analyses	2.1	Keep only current analyses and update yearly
Hazard analyses and hazard evaluation reports	2.1	Keep for life of system and update every 5 years
Inspections by your organization	2.2	None
Actions taken on employee reports of hazards or close calls directly to you	2.3	None
You are encouraged to keep completed JSC Form 1627 and supporting documentation	2.6	None
You are encouraged to keep records of any trend analysis you do within your organization	2.7	None
• Procedures or work instructions that document safe work practices • Directives or other documentation that provide safety and health rules for individual work areas or organizations • PPE hazard analyses and other PPE documentation required by Chapter 5.6 • Documentation required for hazard control programs described in the chapters listed in paragraph 3.2.7 of Chapter 3.2 • Hazard analyses and job hazard analyses (Chapter 2.3) that document hazard controls that support this sub-element	3.2	Keep only current procedures, directives, rules, and analyses.
Other OSHA-required records at the organizational level	3.2	Format and timeline as required by OSHA
Process safety management documentation (if required)	3.3	Format and timeline as

		required by OSHA
Organizational maintenance schedules and procedures	3.4 or 10.4	Keep only current procedures and schedules
Organizational maintenance records to show completed maintenance	3.4 or 10.4	None
Tracking for hazards not tracked in StAR to include work requests or other supporting documentation	3.5	None
Posted JF1240s	3.5	Keep only while posted
Current roster of employees requiring enrollment in medical surveillance and screening programs	3.6	None
Records of disciplinary action for safety violations	3.7	None
Organizational emergency action plans and Facility Evacuation Plans	3.8	Keep current plans only
Training and certification plans and records on training or certification by your organization	4.1 & 5.8	Keep current plans and records only
JSC Form 2150 to document employee participation in fire drills or fire evacuation training	4.2	None
Documentation supporting required organizational emergency drills other than fire drills	4.2	None
Canceled confined space entry permits	6.10	Keep for 1 year only
Inventory of hazardous chemicals in your facilities	9.2	Keep current inventory only
Facility baseline documentation records	10.4	Keep for life of the facility
Facility and operations records (such as TRR documentation or documentation on engineering controls)	Parts 5–10	None

4.0 SAFETY AND HEALTH RECORDS AND REPORTS MANAGEMENT PROVIDES EMPLOYEES

- Post hard or electronic copies of all safety and health evaluations and inspections, hazard analyses, and job safety analyses in a readily accessible location.
- Place a copy of the work area hazardous material inventory and MSDSs/SDSs in a readily accessible location (see Chapter 9.2).
- Provide employees copies of their individual exposure monitoring results when requested to do so by the Space Medicine Operations Division.

5.0 SAFETY AND HEALTH RECORDS AND REPORTS FOR NASA HEADQUARTERS

JSC must make the following records available to NASA Headquarters, Office of Safety and Mission Assurance:

- Documentation from Center-level safety committees.
- Results of external safety and health reviews.
- Center-level policy and requirements documents that implement headquarters safety and health requirements.
- Copies of waivers to NASA requirements granted at the Center.

Attachment 2.3A, System Safety Program Plan Outline

1.0 WHAT IS A SYSTEM SAFETY PROGRAM PLAN (SSPP)?

An SSPP describes your system safety effort for a project or part of a project. It is part of a formal, disciplined system safety program.

You may tailor your SSPP to your project. It must include the entire life of the project from concept, to operations, to phase-out and disposal.

2.0 SSPP REQUIREMENTS

An SSPP should follow the guidelines in Appendix F of NPR 8715.3, “NASA General Safety Program Requirements.”

Each institutional and flight program may have different requirements for an SSPP. This attachment outlines a generic SSPP. See the system safety requirements for the program that you are working on for more details.

An SSPP must:

a. Describe the scope of the project.

b. Describe any relationships between system safety and other project requirements, tasks, and elements. You should cross-reference these to avoid duplication.

c. List any documents and specifications that your system safety effort will use either as directives or as guidance.

d. Identify system safety engineering requirements, tasks, and responsibilities on an item-by-item basis.

e. Be updated as the project direction or requirements change.

SSPP contents

3.0 SYSTEM SAFETY ORGANIZATION

The SSPP must describe:

a. The system safety organization or function. Include charts to show the organizational and functional relationships and lines of communication.

b. The responsibility, authority, and accountability of system safety personnel and other organizations (including contractors and subcontractors) involved in the system safety effort. Assign an organization to be responsible for each task. Identify the authority for resolving all identified hazards. Include the title, address, and telephone number of the System Safety Program Manager.

c. How the system safety organization is staffed for the length of the project. Include labor loading and qualifications of key personnel.

d. The interfaces between the system safety organization and other related disciplines, such as engineering, occupational safety and health, reliability, quality assurance, or medical support at all levels of the project (NASA, contractor, and subcontractor).

4.0 SYSTEM SAFETY PROJECT MILESTONES

The SSPP must:

a. Identify safety milestones. Review the effectiveness of the system safety effort at critical safety checkpoints (e.g., design reviews, self-evaluations, operational readiness reviews, audits, etc.).

b. Schedule safety tasks. Show start and finish dates, report dates, review dates, and labor loading, as they relate to other project milestones.

c. Identify other engineering tasks such as design analyses, tests, or demonstrations that also apply to the system safety program. Include the estimated system safety personnel who will do these tasks as part of this section.

5.0 SYSTEM SAFETY AND RISK MANAGEMENT

The SSPP must:

a. List the safety standards and system specifications the project either must follow or will adopt as a requirement. Include any system safety requirements or definitions that aren't covered in JSC documents.

b. Describe how you will coordinate the system safety efforts of different parts of the project. Include charters of any system safety groups and methods to:

- Distribute system safety requirements to action organizations.
- Coordinate and integrate hazard analyses.
- Hold management and engineering reviews.
- Report program status.

c. Describe the procedures for assessing risk. Include:

- Hazard severity categories.
- Mishap probability (or frequency) levels.
- The method for finding risk levels such as a risk matrix.
- The acceptable risk levels for the project.

d. Describe the management controls to make sure the project follows safety requirements. Include the process for making management decisions and the level of management required to accept different levels of risk. Include methods to make management aware of and take action on:

- Critical and catastrophic hazards.
- Corrective actions to hazards.
- Mishaps or malfunctions.
- Variances to safety or program requirements.

6.0 HAZARD ANALYSES

The SSPP must describe how you will do hazards analyses for the project, to include:

a. The analysis techniques and format that you will use to identify hazards, their causes, their effects, and recommended corrective actions.

b. What analysis techniques you will use and when you will use them.

c. How you will integrate hazard analyses from different organizations such as contractors and subcontractors.

d. A single closed-loop system for tracking hazards to closure.

7.0 SYSTEM SAFETY DATA

The SSPP must:

a. Describe the approach for researching, distributing, and analyzing historical hazard or mishap data.

b. Identify the data management needs for making risk decisions.

c. Identify the safety-related data that you will reference and how you will keep the data. State how Safety and Mission Assurance may access the data.

8.0 SAFETY VERIFICATION AND AUDITS

The plan must describe:

a. The verification and audit requirements and procedures to make sure that the system safety program has been implemented.

b. The procedures to make sure that safety information is available for management and engineering review and analysis.

c. The review procedures to make sure that hazardous tests, and especially tests involving human test subjects, are conducted safely.

9.0 TRAINING

Describe techniques and procedures to make sure that engineers, test subjects, technicians, operators, and support (including maintenance) personnel understand the objectives and requirements of the system safety program.

10.0 OTHER SAFETY REVIEWS OR SURVEYS FOR YOUR PROJECT

List any other reviews or audits that will help you evaluate the safety of your project during design or operation. These reviews may include any of the following:

a. Special surveys for very hazardous systems or for changes to these systems to make sure that risks are properly identified and managed.

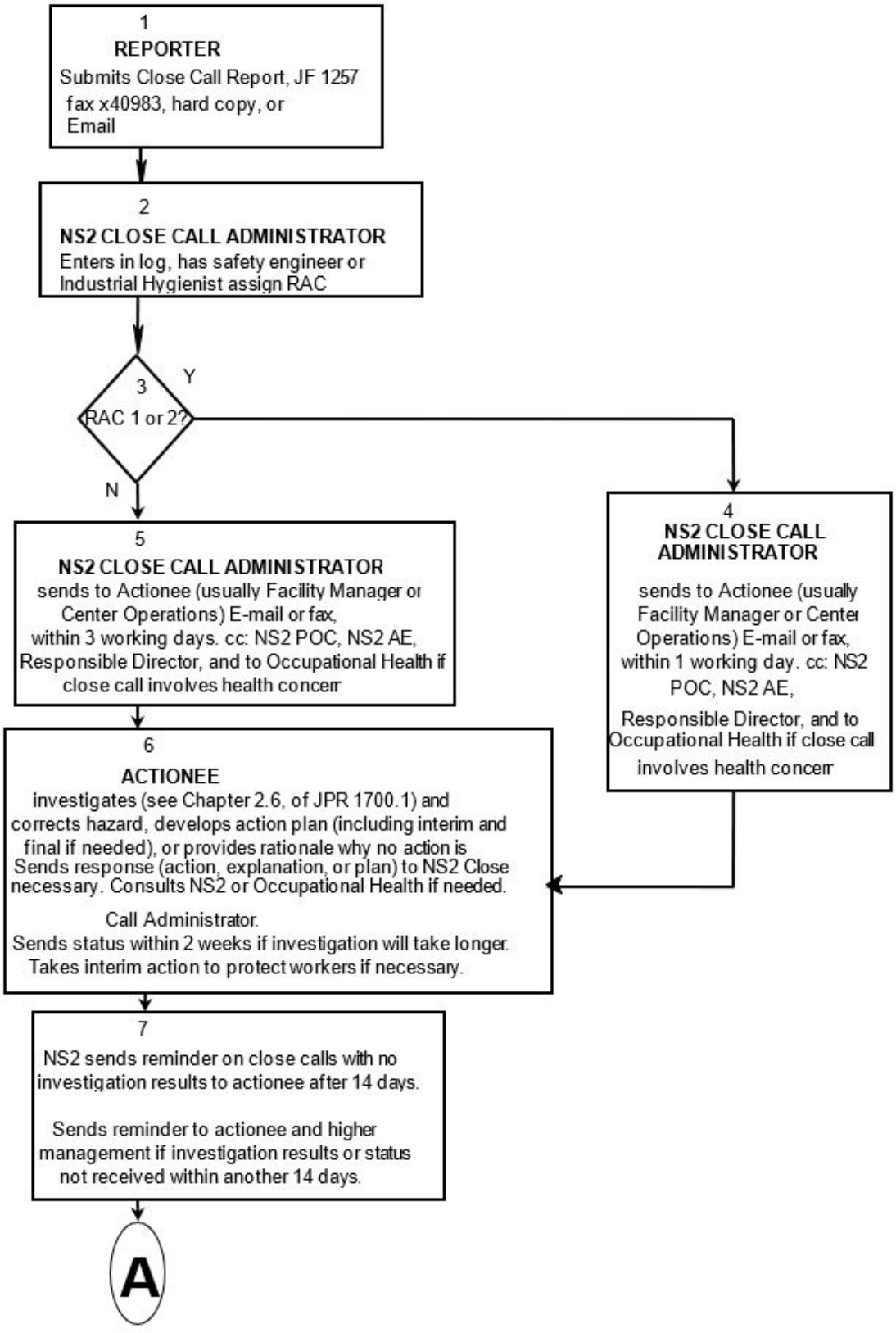
b. A review by experts outside your project during readiness reviews, such as TRRs, operational readiness inspections, or acceptance reviews.

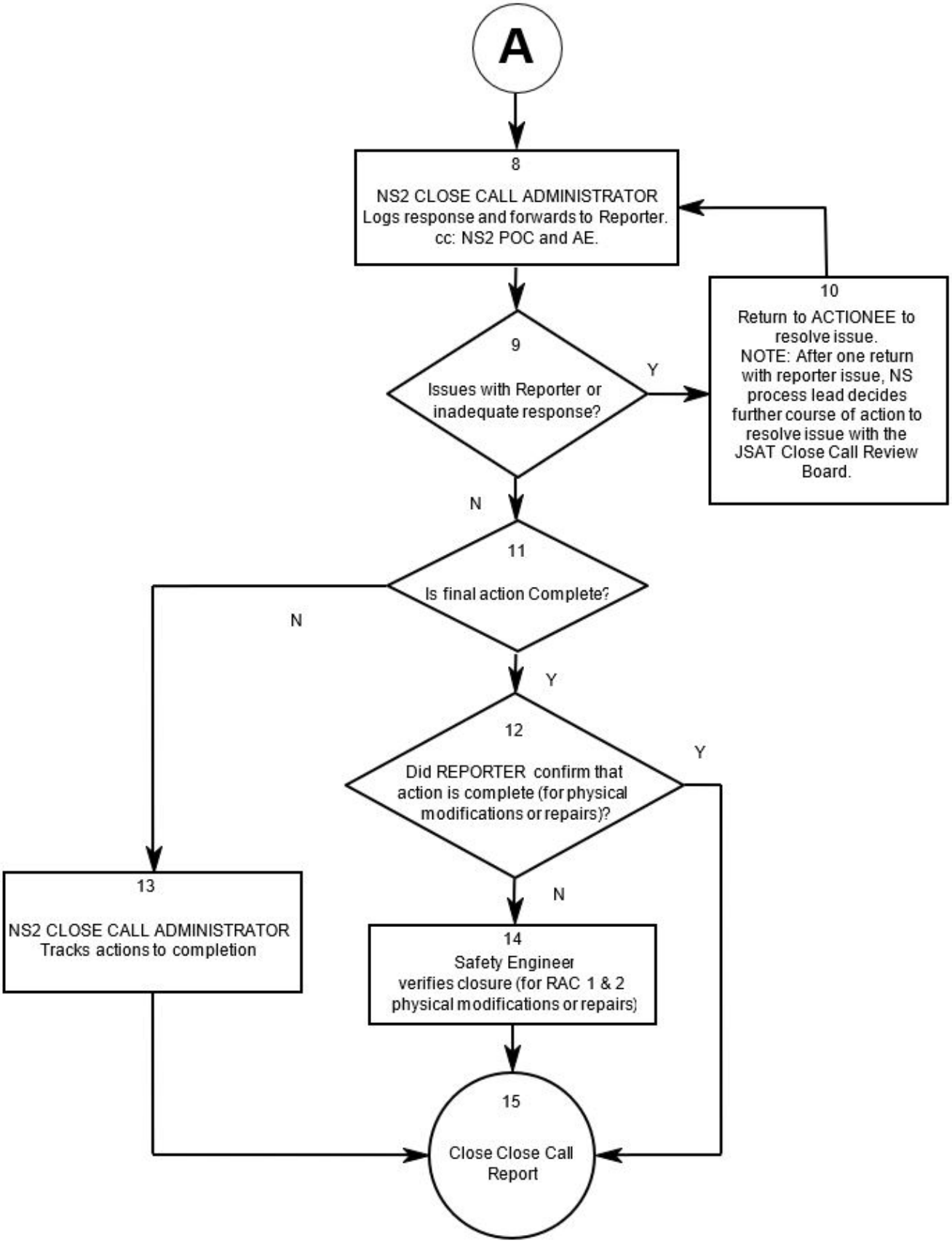
c. System safety audits by JSC organizations or NASA Headquarters for major projects and facilities. These audits should be done periodically and consider:

- Did the system perform as planned?
- Were all hazards identified and controlled effectively?
- Did the hazard and risk analysis result in effective risk decisions?
- Have design or operational changes increased the risk of the system?

d. A review by the Operations and Engineering Panel during the detailed design phase as described in paragraph 1.9.3 of NPR 8715.3, “NASA General Safety Program Requirements,” for major facilities. The Operations and Engineering Board is a NASA Headquarters panel that reviews certain facilities it chooses to, or is required to, review. You will be notified if the Operations and Engineering Board will review your facility.

Attachment 2.5A, Close Call Process




A
8
NS2 CLOSE CALL ADMINISTRATOR Logs response and forwards to Reporter. cc: NS2 POC and AE.
9
Issues with Reporter or inadequate response?
Y
10
Return to ACTIONEE to resolve issue. NOTE: After one return with reporter issue, NS process lead decides further course of action to resolve issue with the JSAT Close Call Review Board.
N
11
Is final action Complete?
N
Y
12
Did REPORTER confirm that action is complete (for physical modifications or repairs)?
Y
N
13
NS2 CLOSE CALL ADMINISTRATOR Tracks actions to completion
14
Safety Engineer verifies closure (for RAC 1 & 2 physical modifications or repairs)
15
Close Close Call Report

Attachment 2.6A, Immediate Response to a Mishap

See list of emergency numbers on next page.

If you are on the scene or the first one to arrive:

1. PULL MANUAL FIRE ALARM BOX or DIAL x33333 for fire, explosion, chemical spills, air emissions (vapor cloud or smoke), personnel rescue, or building evacuation. Give this information to the dispatcher when you telephone:
   - Your name and telephone extension at which you may be called during the emergency
   - Exact location of the emergency
   - Type and extent of emergency

   Stay on the telephone until the dispatcher acknowledges receipt of information.
   If mishap is an on-site vehicle accident, call Security at x34658. If injuries have occurred, call x33333.

2. Help the injured only if you can do so without endangering yourself. Never move an injured person unless failure to do so will result in further injury or death. If you can't help or move the injured or ill person, wait for emergency personnel such as the Fire Department or Incident Response Team to arrive.

3. Limit further injury to people, property damage, and impact to the environment as much as possible only if you can do so without endangering yourself.

4. Take ambulatory injured or ill persons to the JSC Clinic, Building 8.

5. Get names and addresses of witnesses.

6. Restrict access to scene and evidence of mishap until investigator arrives or investigation is complete.

7. Notify your supervisor of the emergency and actions taken; request that he or she notify the Safety and Test Operations Division at x32084.

8. In cases of off-site accidents involving NASA property or JSC or contractor personnel:
   - **Seek help from nearest medical or fire facility.**
   - Follow other appropriate actions such as items 2, 3, 5, 6, and 7 above.

Emergency numbers

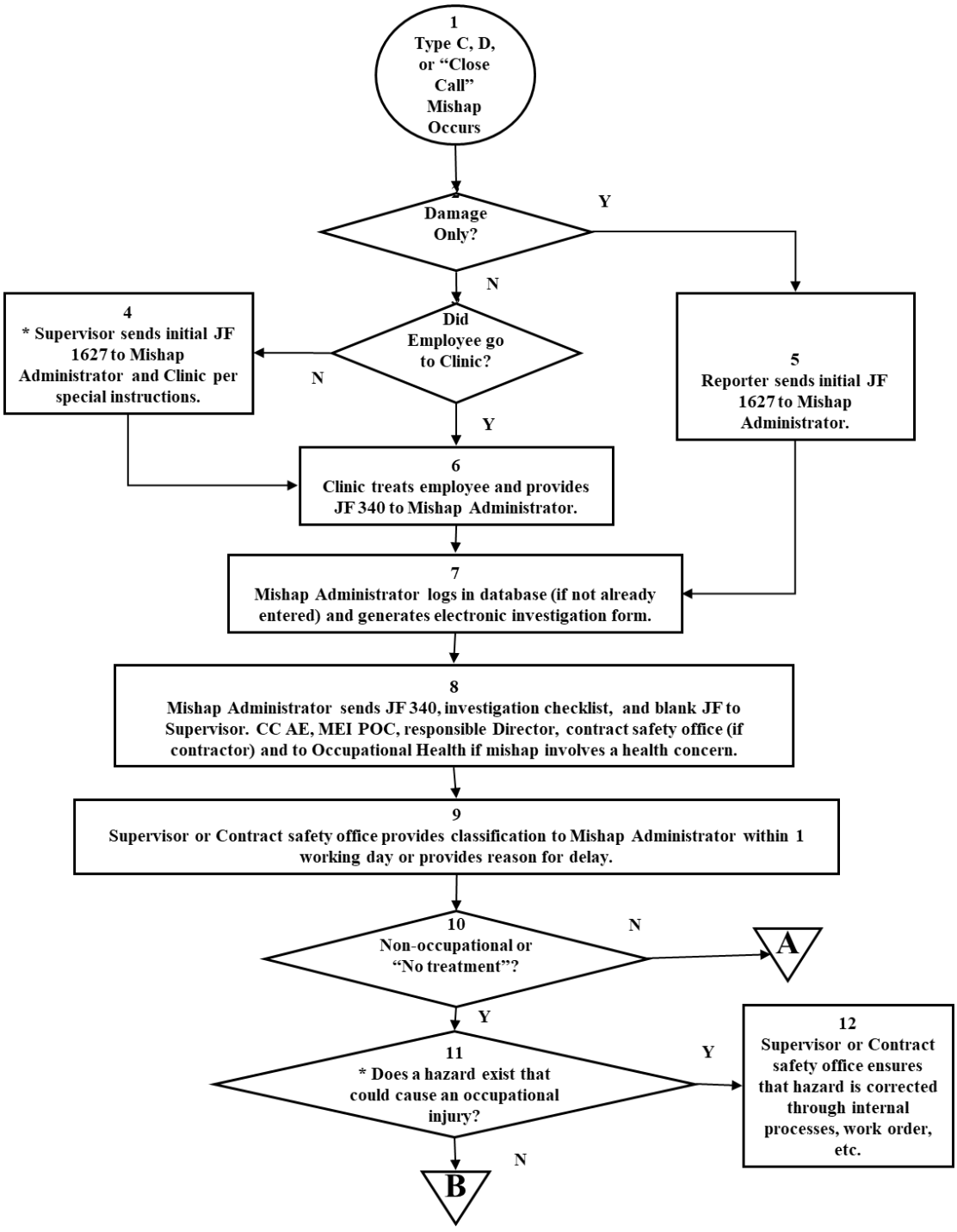
Dial x33333 day or night to report:

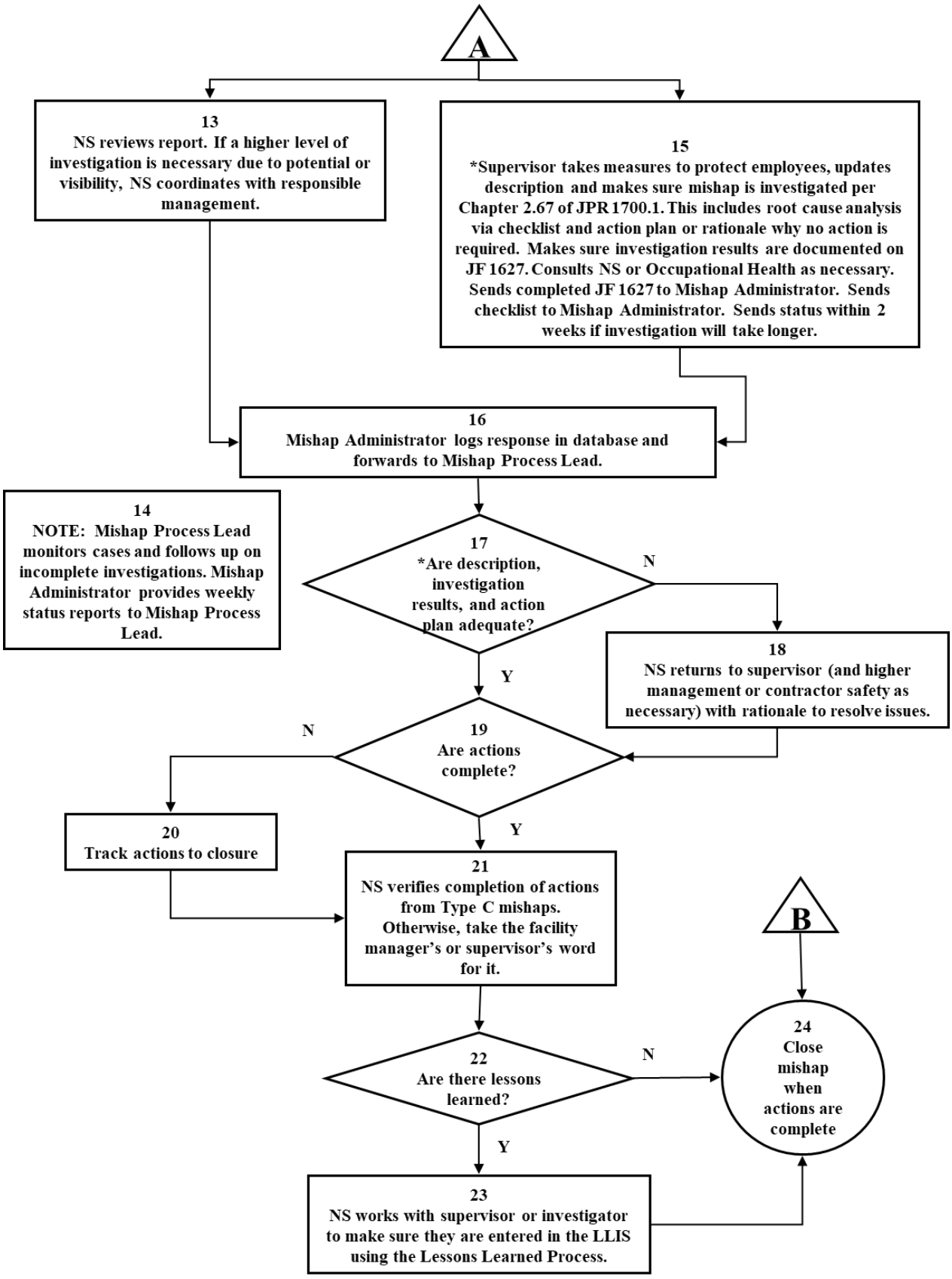
- Injury – Ambulance
- Fire
- Vehicle accident – Security
- Hazardous materials release or spill – Incident Commander

Other important numbers on site include:

- x34111 – Clinic
- x32038 – Facilities Maintenance and Repairs
- x34317 – Space Medicine Operations Division
- x36726 – Occupational Health
- x34900 – Safety and Test Operations Division
- x37084 – Radiological Health Office
- x33061 – Utility interruptions or failure
- x33501 – Environmental Office (daytime only)

Attachment 2.6B, Mishap Investigation Process for Type C, D, and "Close Call" Mishaps




A
13
NS reviews report. If a higher level of investigation is necessary due to potential or visibility, NS coordinates with responsible management.
15
*Supervisor takes measures to protect employees, updates description and makes sure mishap is investigated per Chapter 2.67 of JPR 1700.1. This includes root cause analysis via checklist and action plan or rationale why no action is required. Makes sure investigation results are documented on JF 1627. Consults NS or Occupational Health as necessary. Sends completed JF 1627 to Mishap Administrator. Sends checklist to Mishap Administrator. Sends status within 2 weeks if investigation will take longer.
16
Mishap Administrator logs response in database and forwards to Mishap Process Lead.
14
NOTE: Mishap Process Lead monitors cases and follows up on incomplete investigations. Mishap Administrator provides weekly status reports to Mishap Process Lead.
17
*Are description, investigation results, and action plan adequate?
N
18
NS returns to supervisor (and higher management or contractor safety as necessary) with rationale to resolve issues.
Y
19
Are actions complete?
N
20
Track actions to closure
Y
21
NS verifies completion of actions from Type C mishaps. Otherwise, take the facility manager's or supervisor's word for it.
B
22
Are there lessons learned?
N
24
Close mishap when actions are complete
Y
23
NS works with supervisor or investigator to make sure they are entered in the LLIS using the Lessons Learned Process.

Attachment 2.6C, Mishap Investigation Checklist

Complete this checklist by examining the scene, interviewing witnesses, and examining other evidence. Justify "no" answers to questions 1 and 2. Then go to the list of suggested actions.

1. Were there any unsafe or unhealthful conditions that led to this mishap? Yes No
2. Were there any unsafe acts that led to this mishap? Yes No

   If "No," stop here. If "Yes," answer questions 3–9.
3. Does a Job Hazard Analysis exist? Yes No
   A. If so, are the identified hazards adequately controlled? Yes no
4. Is training necessary for the task? Yes no
   A. If so, were employee(s) involved properly trained? Yes no
5. Are procedures necessary for the task? Yes no
   A. If so, do they exist? Yes no
   B. If so, were employee(s) involved aware of them? Yes no
   C. If so, did the employee(s) involved follow them? Yes no
6. Are safe work practices or requirements necessary for the task? Yes no
   A. If so, do they exist? Yes no
   B. If so, are they easy to understand? Yes no
   C. If so, were employee(s) involved aware of them? Yes no
   D. If so, did the employee(s) involved follow them? Yes no
7. Is ppe necessary for the task? Yes no
   A. If so, did employee(s) involved know it is necessary and how to use it properly? Yes no
   B. If so, did employee(s) involved use it properly? Yes no
8. Are indicators and controls easy to understand and operate? Yes no
9. Are any permits (hazardous operations, confined space, hot work, etc.) required for the task? Yes no
   A. If so, were employee(s) involved aware they are necessary? Yes no
   B. If so, were the permits handled properly? Yes no
10. Were there any other system or management factors that may have contributed to the unsafe act, such as:
    A. Management pressure? Yes No
    B. Inadequate supervision? Yes No
    C. Peer pressure? Yes No
    D. Stress, exhaustion, or workload? Yes No
    E. Boredom or physical discomfort? Yes No
    F. Mismatch of employee to job? Yes No
    G. Off-the-job events that could have affected the mishap? Yes No

Recommended actions

See the list below for suggested actions. Note actions on investigation form. For incomplete actions, note the responsible person (name, phone, and mail code) and expected completion date.

1. If “Yes,” correct the conditions using a work order or internal process.

2. If “Yes,” take action as suggested for questions 3–10.

3. If “No,” do a Job Hazard Analysis. See URL: Example_Hazard_Analysis
   A. If “no,” provide adequate controls for the identified hazards.

4. If “Yes,” take action as suggested for 4a below.
   A. Make sure all employees doing this task are properly trained from now on.

5. If “yes,” take action as suggested for 5a–5c below.
   A. If “no,” create adequate procedures for the task.
   B. If “no,” make sure all employees doing this task are aware of and adequately trained in the procedures.
   C. If “no,” determine why the employee(s) failed to follow procedures. If it was an honest mistake, counseling may be in order. If it was a willful disregard for procedures, disciplinary action may be in order.

6. If “yes,” take action as suggested for 6a–6c below.
   A. If “no,” create adequate safe work practices or requirements for the task.
   B. If “no,” make sure all employees doing this task are aware of and adequately trained in the safe work practices or requirements.
   C. If “no,” determine why the employee(s) failed to follow safe work practices or requirements. If it was an honest mistake, counseling may be in order. If it was a willful disregard, disciplinary action may be in order.

7. If “Yes,” take action as suggested for 7a – 7b below.
   A. If “no,” make sure all employees doing this task are aware that PPE is necessary and how to use it properly.
   B. If “no,” determine why the employee(s) failed to use PPE or use it properly. If it was an honest mistake, counseling may be in order. If it was a willful disregard, disciplinary action may be in order.

8. If “yes,” take action as suggested for 8a–8b below.
   A. If “no,” make sure all employees doing this task are aware that permits are necessary.
   B. If “no,” determine why the employee(s) failed to handle the permits properly (or didn’t use them). If it was an honest mistake, counseling may be in order. If it was a willful disregard, disciplinary action may be in order.

9. If “no,” redesign indicators or controls to make them easier to understand or operate.

10. Were there any other system or management factors that may have contributed to the unsafe act?
    A. If “yes,” identify the source of the management pressure and remove it.
    B. If “yes,” determine what supervision is necessary to do the job safely and make sure it is provided.
    C. If “yes,” identify the source of peer pressure and remove it.
    D. If “yes,” take measures to reduce excess stress, exhaustion, or workloads.
    E. If “yes,” consider automating tasks to prevent boredom or redesign the job to reduce discomfort.
    F. If “yes,” review job qualifications and assignments. Improve employee qualifications or reassign personnel.
    G. If “yes,” be aware of it. Be sensitive to the employee since the circumstances may not have been preventable.

Attachment 2.6D, OSHA and NASA Mishap Categories

The following table correlates OSHA and NASA definitions.

OSHA Category	NASA category
Death or hospitalization of three or more persons for more than observation is immediately reportable to OSHA within 8 hours.	*Type A Mishap* (one or more of the following): • Death • A permanent total disability • Hospitalization of three or more persons within 30 workdays of the mishap for inpatient care • Damage greater than or equal to $2M
Lost workday case involving days away from work.	*Type B Mishap* (one or more of the following): • Permanent partial disability • Hospitalization of one or two persons within 30 workdays of the mishap for inpatient care • Damage greater than or equal to $500,000 and less than $2M
Days away, restricted, transfer – Cases that involve *days away from work* or *days of restricted work activity*, transfer to another job or any combination of the three. Lost Workdays (consecutive or not) on which the employee would have worked but could not because of an occupational injury or illness, not including the day of the injury. Lost workday case involving restricted duty (restricted work activity) – Workdays (consecutive or not; not including the day of the injury) on which, because of an injury or illness, the employee: (1) Was temporarily assigned to another job; or (2) Worked at a permanent job less than full time; or (3) Worked at a permanently assigned job but could not do all duties normally connected with that job.	*Type C Mishap* (one or more of the following): • Lost workday case • Restricted duty • Transfer to another job • Damage greater than or equal to $50,000 and less than $500,000
No corresponding OSHA category	*Mission or Test Failure* Prevents accomplishing primary mission or test objectives
No corresponding OSHA category	*Environmental Impact* Results in an unplanned and uncontrolled hazardous material spill or release or an environmental violation or fine
Medical Treatment Case as defined by OSHA	*Type D* (one or both of the following): • Injury or illness without lost time that requires “medical treatment” as defined by OSHA • Damage greater than or equal to $20,000 and less than $50,000
First-Aid Case as defined by OSHA Not OSHA-Recordable	*First-Aid Case* Injury or illness that requires only first-aid treatment (NASA Headquarters includes this in the “Close Call” category)
No corresponding OSHA category	*Close Call* (one or both of the following) • An event or a condition that could have resulted in an injury, an illness, or property damage, but did not. • Damage less than $20,000

Attachment 3.6A, Workers' Compensation for Civil Service Employees

1.0 WORKERS' COMPENSATION

This Appendix tells you how to apply for workers' compensation benefits as a civil service employee. The Federal Employee Compensation Act (FECA) provides workers' compensation benefits for civil service employees who are injured or become ill on the job. It also provides benefits to the survivors of those who die from job-related injuries or illnesses. If you are a contractor employee, follow your company's process to apply for workers' compensation benefits.

2.0 APPLYING FOR WORKERS' COMPENSATION AS A CIVIL SERVICE EMPLOYEE

To apply for workers' compensation, you must:

a. Tell your supervisor and go to the JSC Clinic if you have a job-related injury or illness.

b. Complete a JSC Form 340, "JSC Report of Occupational Injury or Illness."

c. Call the compensation specialist at (281) 483-4111 to discuss your benefits and request a Form CA-1. Complete the Form CA-1, have your supervisor sign it, and hand-carry it to the Injury Case Manager at the JSC Clinic, Building 8, room 244-D (or send it to Mail Code SD-32) as soon as possible and within 2 days of the injury or illness.

If you are injured, you must file a written notice of your injury on a Form CA-1 within 30 days of the injury to qualify for continuation of pay.

d. Get prior authorization from the compensation claims specialist before you seek private medical care. If it is an emergency, you may get private medical care without authorization. You must contact the compensation claims officer or specialist during the next working day.

e. Provide all information required to process your claim.

f. Submit to a medical examination if required to determine whether you are medically disabled. If you don't submit to a medical examination, your claim may be denied.

g. Return to your job if you are found fit for full duty.

h. Accept a light duty assignment if you are partially disabled. Your attending doctor will determine your workload and length of time on light duty.

3.0 WHAT TO DO IN AN EMERGENCY

If an employee is injured in an emergency:

a. Call your emergency number. The ambulance personnel will decide whether the injured employee should go to the JSC Clinic or a hospital.

b. If you are the employee's supervisor, you should go with the employee or send a coworker with the employee to the hospital.

c. If you go with an injured employee to the hospital, contact the compensation claims specialist when you arrive. The compensation claims specialist will authorize medical treatment at that time.

d. If you are the employee's supervisor, you should contact the compensation claims specialist immediately after the ambulance personnel begin treating the injured employee and report the following:

- Name of the employee
- Whether the employee is a civil servant or contractor
- The nature of injury
- When, where, and how it happened
- The names of any witnesses
- Where the employee was taken

Remember, your emergency numbers are: x33333 at JSC, Sonny Carter Training Facility, and Ellington Field, 911 at any off-site location, and x5911 at WSTF.

4.0 THE COMPENSATION CLAIMS OFFICER OR SPECIALIST

The compensation claims officer or specialist will:

a. Counsel you and your supervisor about your responsibilities and benefits after an on-the-job injury or illness.

b. Help you and your supervisor complete the necessary forms, process the necessary forms he or she must complete, and submit the forms as soon as possible to the Office of Workers' Compensation Programs.

c. Help you and your management find and correct the cause of your injury or illness.

d. Monitor your claim and medical information after it is approved to determine when you may return to work.

e. Authorize a clinic medical officer, your own doctor, or a hospital of your choice to treat you.

f. Work with your supervisor, the Human Capital Office, and other management officials to provide you light duty assignments and make reasonable accommodations if you are partially disabled by job-related injuries.

g. Contact the Office of Workers' Compensation Program to get the status of your claim, payment for compensation, and medical care.

h. Advise your supervisor, the Safety and Test Operations Division, and the Payroll Office how to charge lost time.

i. Monitor all claims to verify that all requirements are followed and only valid claims are paid. Submit necessary medical reports to the Office of Workers' Compensation Programs.

5.0 FOR MORE INFORMATION ON WORKERS' COMPENSATION

You can find more information in NPR 1800.1, "NASA Occupational Health Program Procedures," Chapter 6.

6.0 RESPONSIBILITIES FOR WORKERS' COMPENSATION

a. As a ***JSC manager***, you must:

- Make sure that your employees know and fulfill their responsibilities in paragraph 3 above.
- Fulfill your responsibilities in paragraphs 3 and 4 above.
- Help an injured or ill employee complete workers' compensation forms.
- Make sure lost time for injured employees is correctly charged. Contact the compensation claims specialist or Payroll Office for help.
- Contact the compensation claims officer or specialist if you have valid proof that a claim should be denied as soon as possible.
- Support the investigation of mishaps that result in workers' compensation claims.
- Take action to prevent such mishaps from happening again.

b. ***Site clinics*** must:

- Provide emergency or first-aid care for job-related injuries or illnesses.
- Document job-related injuries or illnesses.
- Give the compensation claims specialist any medical information required to support or deny a claim.

Attachment 3.8A, Emergency Actions

You must take the following actions in the following situations as described in the table below.

If you . . .	***Then . . .***
Hear a building fire alarm	• Leave the building immediately using the exit routes shown on the facility evacuation diagram on your floor. • DON'T use elevators to evacuate – ONLY emergency personnel involved in rescue operations are allowed to use the elevators. • If you need rescue assistance or are a designated "buddy" for a person needing rescue assistance, you should follow the procedures established for your building by the facility manager. See paragraph 3.8.8 of Chapter 3.8. • Help others evacuate the facility as needed without delaying your own evacuation or jeopardizing your safety. Use an alternate route if you can't use the primary exit route. • Shut down hazardous operations and secure classified material if you have time. • Go to a "safe area" designated by your supervisor or as stated in the EAP so he or she can account for you. Do not congregate in parking lots, since you may interfere with arriving fire-fighting vehicles. • Move your group to another area if the "safe area" isn't safe. • Remain at least 75 feet from the building in the assembly area until you get further instructions. • NEVER reenter an evacuated area until declared safe by safety personnel on the scene or the ALL CLEAR siren is sounded. • Never use vehicle parking areas as a "safe area" for assembly.
See a fire	• Evacuate people from the building by pulling the lever on a fire alarm pull box. This will ring the building fire alarm bells and signal the dispatcher. • Call your emergency telephone number from a safe location to make sure the dispatcher got the alarm signal. • Say, "I am calling to report a fire..." • Tell the dispatcher where the fire is (building and room number), how big the fire is, and what type of fire it is (e.g., chemical, electrical, or paper). • Stay on the line until the dispatcher says you may hang up. The dispatcher may put your call on hold briefly while emergency units are dispatched. • Give the dispatcher any information you think would help the emergency personnel find the fire. • Tell the dispatcher your name and the extension from which you are calling. • Meet the facility manager or emergency personnel near the building entrance if possible to relay vital information. • Go to a safe area designated by your supervisor so he or she can account for you. • NEVER reenter an evacuated area until declared safe by safety personnel on the scene or the ALL CLEAR siren is sounded.

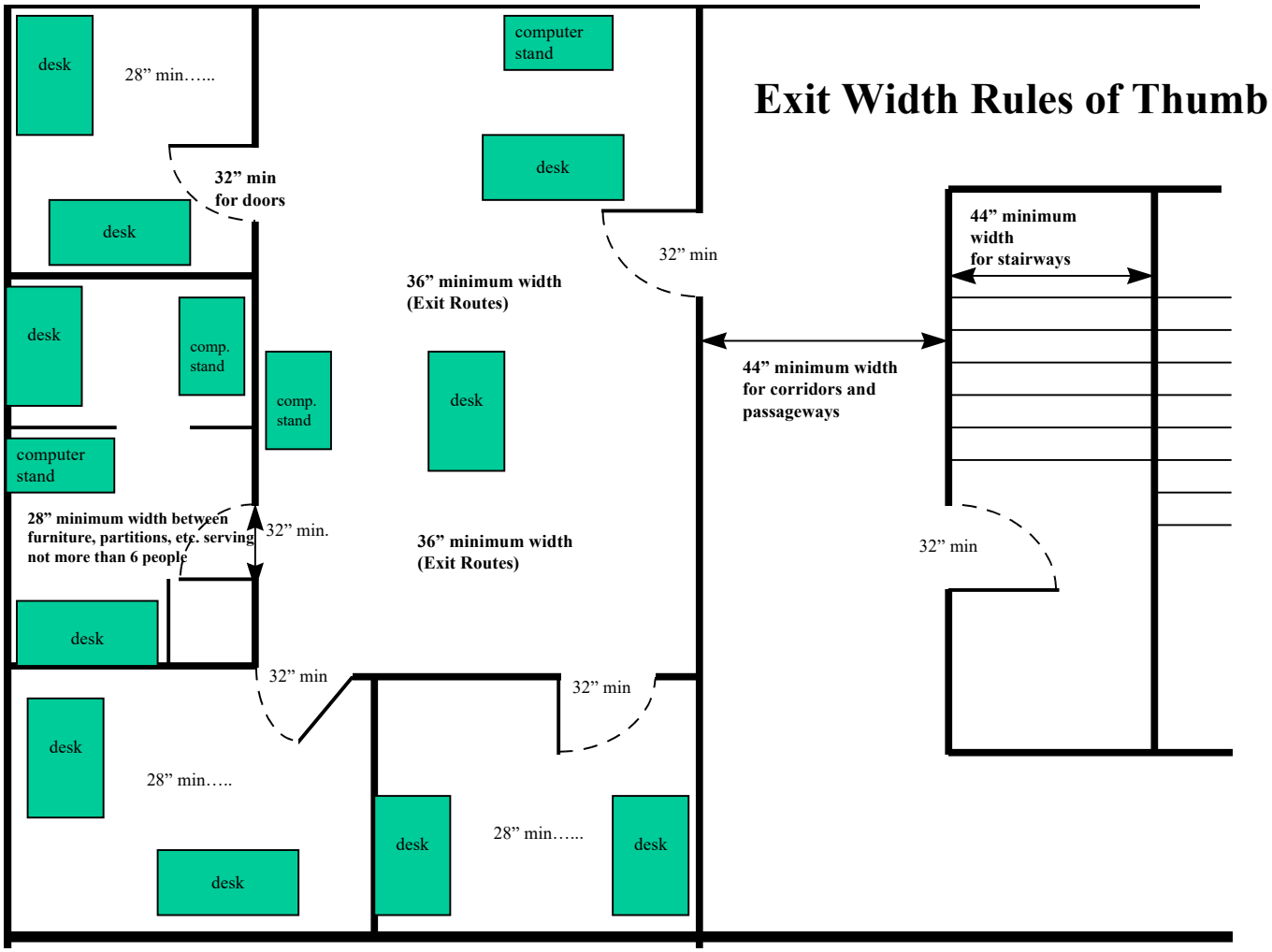
Table continues on next page.

If you . . .	*Then . . .*
Smell smoke Smoke may come from many sources such as: Fluorescent light ballast Appliances such as coffee makers and stoves Jammed paper in a copy machine Electronics Welding or cutting	• Try to find the source of the smoke as soon as possible if it is only a faint odor. • If you can't find the source of the smoke, call your emergency number to ask for help. • If the smell gets stronger, you see flames, or you see large amounts of smoke, evacuate people from the building by pulling the lever on a fire alarm pull box. • Call your emergency telephone number from a safe location to make sure the dispatcher got the alarm signal. • Say, "I am calling to report that I smell smoke..." • Tell the dispatcher where you smelled the smoke (building and room number). • Stay on the line until the dispatcher says you may hang up. The dispatcher may put your call on hold briefly while emergency units are dispatched. • Give the dispatcher any information you think would help the emergency personnel find the smoke. • Tell the dispatcher your name and the extension from which you are calling. • Meet the facility manager or emergency personnel near the building entrance if possible to relay vital information. • Go to a safe area designated by your supervisor so he or she can account for you. • NEVER reenter an evacuated area until declared safe by safety personnel on the scene or the ALL CLEAR siren is sounded.
See or are involved in a medical emergency on your site – even if it isn't work-related	• Call your emergency telephone number from a safe location. • Say "I am calling to report a medical emergency. Please send an ambulance to..." • Tell the dispatcher where the emergency is (building and room number) and who the injured person is, if you know. • Stay on the line until the dispatcher says you may hang up. The dispatcher may put your call on hold briefly while emergency units are dispatched. • Tell the dispatcher what and how bad the injury is, whether it seems life-threatening, and whether the person is conscious or breathing. • Give the dispatcher any information you think would help the emergency personnel find the injured person. • Tell the dispatcher your name and the extension from which you are calling. • Have someone meet the emergency personnel near the building entrance if possible. • Don't move the injured person unless he or she is clearly in a life-threatening situation. • Stay with the injured person until medical help arrives. • Make sure blood is cleaned up only by trained personnel.

Table continues on next page.

If you . . .	*Then . . .*
See an explosion, leaking gas, or a chemical spill	• Call your emergency telephone number from a safe location. • Don’t activate any fire alarms or evacuate any buildings. • Tell the dispatcher what you saw. • Tell the dispatcher what materials are involved, if you know. • Tell the dispatcher where the emergency is and how big the spill, leak, or explosion is. • Stay on the line until the dispatcher says you may hang up. The dispatcher may put your call on hold briefly while emergency units are dispatched. • Give the dispatcher any information you think would help the emergency personnel find the emergency. • Tell the dispatcher your name and the extension from which you are calling. • Stay on the line until the dispatcher says you may hang up. • Stay in your safe location until you get further instructions.

Attachment 5.1A, Exit width rules of thumb



Notes:

1. 32-in. door widths are "clear" widths. (A "clear width" is the width of the opening through the fully open doorway, not the width of the doorframe.)
2. Minimum width of stairways is measured from wall to wall and not from handrail to handrail.

Attachment 6.3A, Periodic Cleaning of Water Coolers

Space Medicine Operations Division Recommendations for Periodic Cleaning of Water Coolers

1.0 Purpose: This document provides an acceptable procedure for cleaning bottled-water dispensers. It describes general sanitary practices with the goal of controlling microbiological contamination in water coolers.

2.0 Frequency: Every 3-4 months, during bottle replacement.

3.0 Personal Protective Equipment (PPE) Required

a. Eye protection: Chemical Goggles or Face Shield
b. Natural latex rubber, nitrile or PVC gloves

4.0 Equipment

a. Water Dispenser
b. Bottled Water
c. Bleach Solution
d. Sponge
e. Bucket

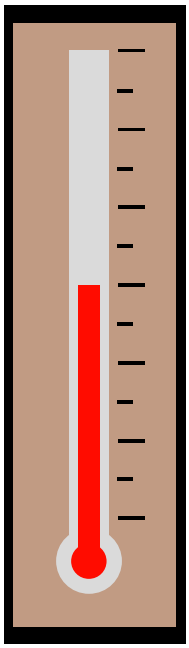
5.0 Procedure

a. Preparing Bleach Solution
   (1) Don PPE.
   (2) Prepare a disinfecting solution by adding one tablespoon (15ml) of household bleach per gallon (4.5L) of water.
   (3) Label the bleach solution container following instructions in Chapter 9.2, paragraph 9.2.17. Also, label with your name and the date.
   (4) Bleach solution must be used within one week of preparation.
b. Cleaning of Water Dispenser
   (1) Unplug the cord from electrical outlet of water dispenser.
   (2) Remove bottle, and drain any water through the spigot.
   (3) Use gloves and eye protection when working with bleach.
   (4) Use the sponge to scrub the interior surface of the water cooler reservoir with the bleach solution and let stand for not less than two minutes but not more than five minutes.
   (5) Drain the bleach solution from the reservoir through the spigot into a bucket.
   (6) Dispose of the bleach solution into the sanitary system.
   (7) Rinse the reservoir thoroughly by filling the reservoir with clean tap water or bottled water four (4) times. Drain the rinse water through the cooler spigots into a bucket. This will remove traces of the bleach solution. Dispose of rinse water into the sanitary system.
   (8) Place new bottle onto dispenser.
c. Cleaning the drip tray
   (1) Lift off the drip tray.
   (2) Remove the screen and wash both tray and screen in mild detergent or bleach solution.
   (3) Rinse well in clean tap water and replace on cooler.

Attachment 6.4A, Normal boiling points of cryogenic fluids

CRYOGENIC THERMOMETER
Normal Boiling Points of Cryogenic Fluids

		DEG. F	DEG. R	DEG. K	DEG. C
KRYPTON	LKr	-242.1	217.59	120.2	-152.8
OXYGEN	LOX	-297.3	162.39	90.2	-182.8
ARGON	LAr	-302.3	157.39	87.4	-185.6
FLUORINE	LF2	-306.7	152.99	85.0	-188
NITROGEN	LN2	-320.4	139.29	77.3	-195.7
NEON	LNe	-410.9	48.79	27.1	-242.9
HYDROGEN	LH2	-423.2	36.49	20.3	-249.7
HELIUM	LHe	-452.1	7.59	4.2	-269/9
ABSOLUTE ZERO		-459.69	0	0	-273.0



Attachment 6.4B, Liquid oxygen

Properties and characteristics:
- Normal boiling point: –297°F (90 K [Kelvin])
- Appearance: pale blue
- Toxicity: toxic to humans
- Vapor density: .279 lb/ft^3 (about one-fourth that of air)

Material incompatibility:
- Causes organic materials to react violently when ignited
- Can detonate powdered organic materials

Flammability: Nonflammable; however, it can rapidly increase rate of burning in a fire

Safety and handling:
- Avoid skin or eye contact
- Use proper storage and handling equipment
- Provide adequate ventilation
- Prevent sources of ignition
- Obtain a thorough knowledge of this material before handling
- Use the “buddy” system when handling

Major hazards:
- Fire: Remember that oxygen/fuel mixtures ignite readily and may explode. Materials that burn in air usually burn much faster in oxygen; materials that do not normally burn in air may burn in oxygen.
- Exposure: Cold gas or liquid may cause skin and eye injuries similar to burns.
- Extreme cold can condense LO_2 and LN_2 on uninsulated surfaces, adding to local fire hazards. Condensed LO_2 can react with oil and grease to cause a fire.

Precautions:

In case of . . .	*Take these actions . . .*
Spill or Leak	Shut off source(s) of ignition. No smoking or use of traffic control flares permitted. Keep unnecessary personnel away from area. DO NOT walk on or roll equipment over spill area until frost has disappeared. Use proper clothing (gloves, face shield, etc.) to enter spill area. Shut off source(s) of supply by using proper equipment. Fog in form of condensed moisture usually indicates water vapor.
Fire	Use water to spray container that is exposed to fire. If substantial parts of container insulation jacket and insulation are gone, vacate general area immediately (explosion hazard).
Exposure	Thaw frosted parts with water. Get prompt medical attention. Air clothing thoroughly for 30 to 60 minutes before smoking or approaching any source of ignition.

Attachment 6.4C, Liquid hydrogen (LH_2)

Properties and characteristics:

- Normal boiling point: –423°F (20 K)
- **Appearance: colorless, odorless**
- Toxicity: nontoxic
- Vapor Density: 0.083 lb/ft^3 (about one-fourteenth that of air)

Material incompatibility: not corrosive or significantly reactive

Flammability limits: in air by volume (H_2 gas): 4.0 to 74.2%

Safety and handling:

- Avoid contact with eyes and skin.
- Use proper storage and handling equipment.
- Provide adequate ventilation.
- Prevent sources of ignition.
- Obtain a thorough knowledge of this material before handling.
- Use the “buddy” system when handling.

Major hazards:

- Fire: LH_2 is extremely flammable. Hydrogen-air mixtures are readily ignited and may be explosive in confined spaces. Flames are invisible. Hydrogen can self-ignite if rapidly released in large volumes.
- Exposure: Cold gas or liquid may cause skin or eye injuries similar to frostbite. Though vapor is not toxic, breathing it may cause sudden unconsciousness because of lack of oxygen.

Precautions:

In case of . .	***Take these actions . .***
Spill or leak	Shut off source(s) of ignition. No smoking or use of traffic control flares permitted. Be aware that invisible flames may be present. Keep unnecessary personnel away from area. Self-contained breathing apparatus and gloves are required to enter spill area. Shut off source(s) of supply by using proper equipment. Fog in form of condensed moisture usually indicates water vapor.
Fire	Permit escaping hydrogen to burn if flow cannot safely be shut off. Spray tank with water if it is exposed to fire. If a substantial part of insulation jacket and insulation is gone, immediately vacate general area (explosion hazard).
Exposure	Remove victim(s) to fresh air. If not breathing, administer CPR; provide oxygen as appropriate. Thaw frosted areas with water. Get medical attention promptly.

Attachment 6.4D, Liquid nitrogen (LN_2)

Properties and characteristics:

- Normal boiling point: –320°F (77 Kelvin)
- Appearance: colorless, odorless
- **Toxicity: nontoxic to humans**
- Vapor density: 0.288 lb/ft^3 (about one-fourth that of air)

Material incompatibility: noncorrosive

Flammability: noncombustible

Safety and handling:

- Avoid contact with eyes and skin.
- Use proper storage and handling equipment.
- Provide adequate ventilation.
- Obtain a thorough knowledge of this material before handling.
- Use the “buddy” system when handling.

Major hazards:

- Fire: LN_2 is inert and will not burn.
- Exposure: Vapor is not toxic, but breathing it may cause sudden unconsciousness because of lack of oxygen. Cold gas or liquid may cause skin and eye injuries similar to burns (frostbite).

Precautions:

In case of . . .	*Take these actions . . .*
Spill or Leak	Keep unnecessary personnel away. Appropriate personnel required. Use appropriate self-contained breathing apparatus in spill area. Fog in form of condensed moisture usually indicates vapor area. Shut off leak source(s) of supply using proper equipment.
Fire	Nitrogen can help put out fire. Spray tank with water if it is exposed to fire.
Exposure	Remove victim(s) to fresh air. If not breathing, apply artificial respiration and oxygen. Thaw frosted areas with water. Get medical attention promptly.

Attachment 8.2A, Policy for issuing locks and tags

1.0 POLICY AND PROCEDURES

This attachment is JSC's policy issuing LO/TO locks, LO/TO tags and operational control tags, which will be called "equipment." Issuing LO/TO equipment will be as follows:

a. The JSC LO/TO Center issuer (LO/TO-CI) issues the equipment. The JSC LO/TO-CI is provided by the Safety and Test Operations Division, mail code NS. The LO/TO-CI will issue equipment to designated contractor safety representatives or their designee (such as a shift supervisor), whose organization conducts LO/TO operations at JSC, Ellington Field, or the Sonny Carter Training Facility.

b. As a designated contractor safety representative, you must submit the normal request for LO/TO equipment to the LO/TO-CI for the amount of equipment that you expect your organization would normally need to conduct LO/TO operations. Request forms are available from the LO/TO-CI. The LO/TO-CI will process requests during daytime work hours.

c. The LO/TO-CI will issue equipment to the contractor requestor and maintain a record of the equipment issued. If additional equipment is needed by the contractor after normal work hours (i.e., nights, weekends, or holidays), you—as a contractor safety representative—or your designee (shift supervisor) can get equipment on an emergency basis from the on-duty Fire Protection Specialist (temporary Center issuer) at Building 25. If the on-duty Fire Protection Specialist is not available at Building 25, you will find a telephone number (security dispatcher) and instructions on the LO/TO equipment storage locker to contact the Fire Protection Specialist, who will return to the site and issue the equipment.

d. Ellington Field and Sonny Carter Training Facility will also have an inventory of equipment available during normal work hours. As the designated contractor safety representative, you must maintain the inventory and be responsible for issuing equipment during normal hours for scheduled LO/TO work, including work scheduled for non-normal hours. If emergency work or work not previously scheduled requires additional equipment, you or your designee must get additional equipment from the Fire Protection Specialist (temporary Center issuer) at JSC.

2.0 RESPONSIBILITIES

a. The ***LO/TO-CI*** is responsible for:

- Submitting purchase orders for LO/TO equipment as needed to maintain a working inventory.
- Issuing LO/TO locks, LO/TO tags, and operational control tags (equipment) during normal work hours and making provisions for issuing LO/TO devices outside of normal working hours and on an emergency basis.
- Maintaining a record of the equipment issued.

- Making sure an adequate amount of replacement equipment is available at JSC, Ellington Field, and Sonny Carter Training Facility by contacting the designated safety representatives periodically.

b. As a ***Designated Safety Representative***, you are responsible for:

- Determining the realistic amount of LO/TO equipment that your organization will need.
- Obtaining the determined amount of equipment from the LO/TO-CI and issuing it as needed to your organization involved in LO/TO operations. Whenever possible, contact the LO/TO-CI in advance to ensure that an adequate supply of equipment will be on hand to meet your request, and request your replacement equipment as needed from the LO/TO-CI.
- Supporting JSC annual inventories and periodic audits of the JSC LO/TO program as required by JSC implementation of 29 CFR 1910.147.

Attachment 8.2B, Operational Control

1.0 JSC'S OPERATIONAL CONTROL PROGRAM

This Attachment is JSC's operational control program to safely control configuration or other operations when lockout/tagout is not required. It provides a consistent and uniform policy and minimum requirements for safe operational control of machinery, equipment, or systems to prevent damage from inadvertent activation. The procedure in this Attachment ensures that machines, equipment and/or systems are, as a minimum, properly and uniformly tagged out throughout JSC.

If you work within the boundaries of JSC, you must follow this JSC basic operational control program. All employers working at JSC must follow this basic JSC program and use the procedure for attaching Warning, Do Not Operate tags to energy-isolating devices. This is to prevent unexpected energization, startup, or release of stored energy to the machinery, equipment, or systems.

Each project, contractor, or organization may take this basic policy and add addendums, as long as the intent of the basic policy is met or exceeded, followed by all employees and strictly enforced.

2.0 GENERAL REQUIREMENTS AND ENFORCEMENT

The following requirements apply to all employees at JSC. If you:

a. See a piece of equipment that is tagged out, you **must never** attempt to start, energize or use that machine, equipment or system.
b. Are responsible for configuring equipment, you must follow the procedures listed below when tagging out.
c. Violate these procedures, you are subject to disciplinary measures by your employer as described in Chapter 3.7, "Disciplinary system."

3.0 JSC'S BASIC TAGOUT PROCEDURE

You must follow these steps when tagging out equipment for purposes other than maintaining, servicing, or repairing equipment:

a. Notify "affected employees" who operate or use the machinery, equipment, or system.
b. Attach tagout tags to the isolation devices for the necessary time. You are also encouraged to use craft or shop locks per your organizations' policy for extra security. However, you must never use a red lockout/tagout lock for operational control.
c. Isolate an energy source with the isolation device.

d. Remove tagout tags from the isolation devices.

e. Restore the machinery, equipment, or system to operation.

f. Notify “affected employees.”

4.0 TAGS

You must only use tagout tags (JSC form 19A, WARNING, DO NOT OPERATE tag) and attach them with nylon cable ties, for operational control.

Tags are essentially **Warning Devices** attached to energy-isolation devices or lockout devices, but provide no physical restraint as would be provided by a lock.

g. When a tag is attached to an energy-isolation device for operational control purposes, other than maintenance or repair activities (lockout/tagout), no one may remove it without authorization of the person responsible for the tag or authorization from a supervisor. It also must never be bypassed, ignored or otherwise defeated.

h. The employee who removes the tag must ensure any control records are updated to record the tag removal and restoration of service.

i. Tag information must be legible and understandable.

j. You must only use JSC Form 19A for Operational Control. Never use JSC Form 19A, WARNING, DO NOT OPERATE, as a DANGER, LOCKOUT TAGOUT tag.

5.0 TAG REMOVAL

Preferably the employee who applied the tag should be the one to remove the tag, but if not practical, the employee’s supervisor is authorized to assign someone to remove the tag when required. Periodically review tags in the area to ensure they are still needed.

6.0 TRAINING FOR OPERATIONAL CONTROL

If you are involved in operational control, you must have lockout/tagout training as described in Paragraph 8.2.12 of Chapter 8.2.

Attachment 8.8A, Training Matrix of Requirements for Fall Protection and Rescue Personnel

	Program Administrator	Qualified Person	Competent Person	Authorized Person / Authorized Rescuer	Competent Person, Competent Rescue, Qualified Person Trainers
Trained or Evaluated By:	• A Competent Person trainer • A Qualified Person trainer.	A Qualified Person trainer.	▪ A Competent Person trainer ▪ A Qualified Person trainer.	▪ A Competent Person, ▪ A Qualified Person, ▪ A Qualified Person trainer, or ▪ A Competent Person trainer. • • The Authorized Rescuer shall be evaluated by: ▪ A Competent Rescuer or ▪ A Competent Rescue Trainer.	
Frequency:		Not less than once every two years.	Not less than once every two years.	Be evaluated at least annually on the items in “Demonstrations” below. Receive training: ▪ Before they are exposed to a fall hazard for the first time; ▪ When the nature of the work changes, ▪ When the nature of the workplace changes, ▪ When the methods of eliminating or controlling a fall hazard change to an extent that prior training is not adequate; ▪ When the person does not have the required level of knowledge, or • When the person is not following the required means and methods.	

	Program Administrator	Qualified Person	Competent Person	Authorized Person / Authorized Rescuer	Competent Person, Competent Rescue, Qualified Person Trainers
Skills Covered:	• Applicable fall protection regulations, • Selecting fall protection systems, including the common hazards associated with each system and component, • Developing a managed fall protection program, • Fall hazard surveys, • Selection and appointment of steering committee personnel, • Developing approved equipment purchase lists, • Selecting and appointing competent and qualified people, • Developing written fall protection, rescue, and evacuation procedures, • Developing engineering system standards, • Developing training programs, • Investigating incidents and near misses.	▪ The responsibilities of authorized, competent, qualified, and program administrators with respect to fall protection, ▪ Applicable fall protection regulations, ▪ Preparing fall hazard surveys, ▪ Fall hazard elimination and control methods, ▪ Selecting fall protection systems, including the common hazards associated with each system and component, ▪ Assessing fall protection systems and determining system safety (clearance requirements, free fall distance, swing fall forces, impact forces), ▪ Developing written fall protection, rescue, and evacuation procedures, ▪ Developing engineering system standards, ▪ Designing, selecting, and analyzing anchorages and anchorage structures, ▪ Designing new, and evaluating existing, horizontal lifelines, ▪ Inspection and recoding of equipment components and systems (including component compatibility), ▪ Determining when fall protection systems are infeasible, ▪ Investigating incidents and near misses.	• The responsibilities of authorized, competent, qualified, and program administrators with respect to fall protection, • Applicable fall protection regulations, • Fall hazard elimination and control methods, • Selecting fall protection systems, including the common hazards associated with each system and component, • Preparing fall hazard surveys, • Developing written fall protection, rescue, and evacuation procedures, • Inspection and recoding of equipment components and systems (including component compatibility), • Assessing fall protection systems and determining system safety (clearance requirements, free fall distance, swing fall forces, impact forces), • Selection, and use, of non-certified work positioning and travel restraint anchorages. • Investigating incidents and near misses.	The program administrator determines what training is required by an Authorized Person and considers: ▪ What trainees are required to know or do; ▪ Any available job analysis and any changes to the job; ▪ Site specific information; ▪ Special abilities, needs, or languages of the trainee; ▪ Previous training provided to the trainee; and ▪ Regulatory requirements and changes to regulations.	Experience, knowledge and training skills in adult education.

	Program Administrator	Qualified Person	Competent Person	Authorized Person / Authorized Rescuer	Competent Person, Competent Rescue, Qualified Person Trainers
Demonstrations:		How to properly: • Select the equipment, • Inspect the equipment prior to use, • Install the equipment, • Anchor appropriately, • Assemble the components, • Use the selected fall protection equipment in the field where the work is done, • Dismantle the system, and • Store the equipment.	How to properly: • Select the equipment, • Inspect the equipment prior to use, • Install the equipment, • Anchor appropriately, • Assemble the components, • Use the selected fall protection equipment in the field where the work is done, • Dismantle the system, and • Store the equipment.	• Demonstrate how to properly use the types of equipment that the person is authorized to operate. • Pass a written examination.	

Attachment 9.5A, Closed Bomb Design, Testing and Operational Safety Requirements

1. CLOSED BOMB

A Closed Bomb is a fixed volume chamber used for testing the pressure and time characteristics of pyrotechnics (pressure cartridges). It may, with analysis, also be designed to provide barrier protection for personnel during close contact bridge wire tests. The following general requirements apply:

a. Vented Test Bombs shall follow the same requirements as a Closed Bomb.

b. Closed bombs that have been fabricated and safely used before the release of this update, as verified by the drawing or sketch release date, are grandfathered from meeting these requirements.

2. CLOSED BOMB DESIGN AND TESTING REQUIREMENTS

The following requirements apply to design and testing of Closed Bomb:

a. Maximum Allowable Working Pressure (MAWP) shall be established at or above the peak pressure produced by the tested pyrotechnic device.

b. Peak pressure shall be calculated and verified by test, as the highest measured pressure from a minimum of five test firings using a nominal explosives load on like pyrotechnic devices.

c. With ESO approval, closed bombs may be fabricated based solely on a calculated peak pressure and shall have a Factor of Safety of 4.0 or greater.

d. Designs shall be detailed on an official sketch or configuration controlled drawing.

e. Each bomb shall be identified permanently with a part number and serial number.

f. Material certifications shall be retained as part of the design review package.

g. Closed bombs 6 inches or less in diameter, that are outside the scope of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, shall be designed per the requirements of ASME B31.3.

h. Closed bombs greater than 6 inches inside diameter shall be ASME Section 8, Div. 1 code stamped vessels.

Attachment 9.5A, Closed Bomb Design, Testing and Operational Safety Requirements (Cont.)

i. Closed bombs are not required to meet the requirements of JPR 1710.13, “Design, Inspection, and Certification of Ground-Based Pressure Vessels and Pressurized Systems”, however, all ASME design calculations shall be independently reviewed by a cerfified Pressure Systems Engineer.

j. Each closed bomb shall be subject to one of the following tests prior to first use:

(1) Proof pressure test at 1.5 times the MAWP

(2) Remote test firing that subjects the closed bomb to 1.25 times the MAWP

k. All metal joining processes (welding, brazing, soldering, etc.) shall meet the requirements of JPR 1710.13 and shall be inspected per the requirements of NS-PRS-008, “Pressure Systems Welding and Brazing Control”.

3. OPERATIONAL SAFETY REQUIREMENTS

The following requirements apply to operating a closed bomb:

a. When Possible, all closed bomb firings shall be performed remotely. After the firing, personnel shall be allowed in close proximity to vent the closed bomb.

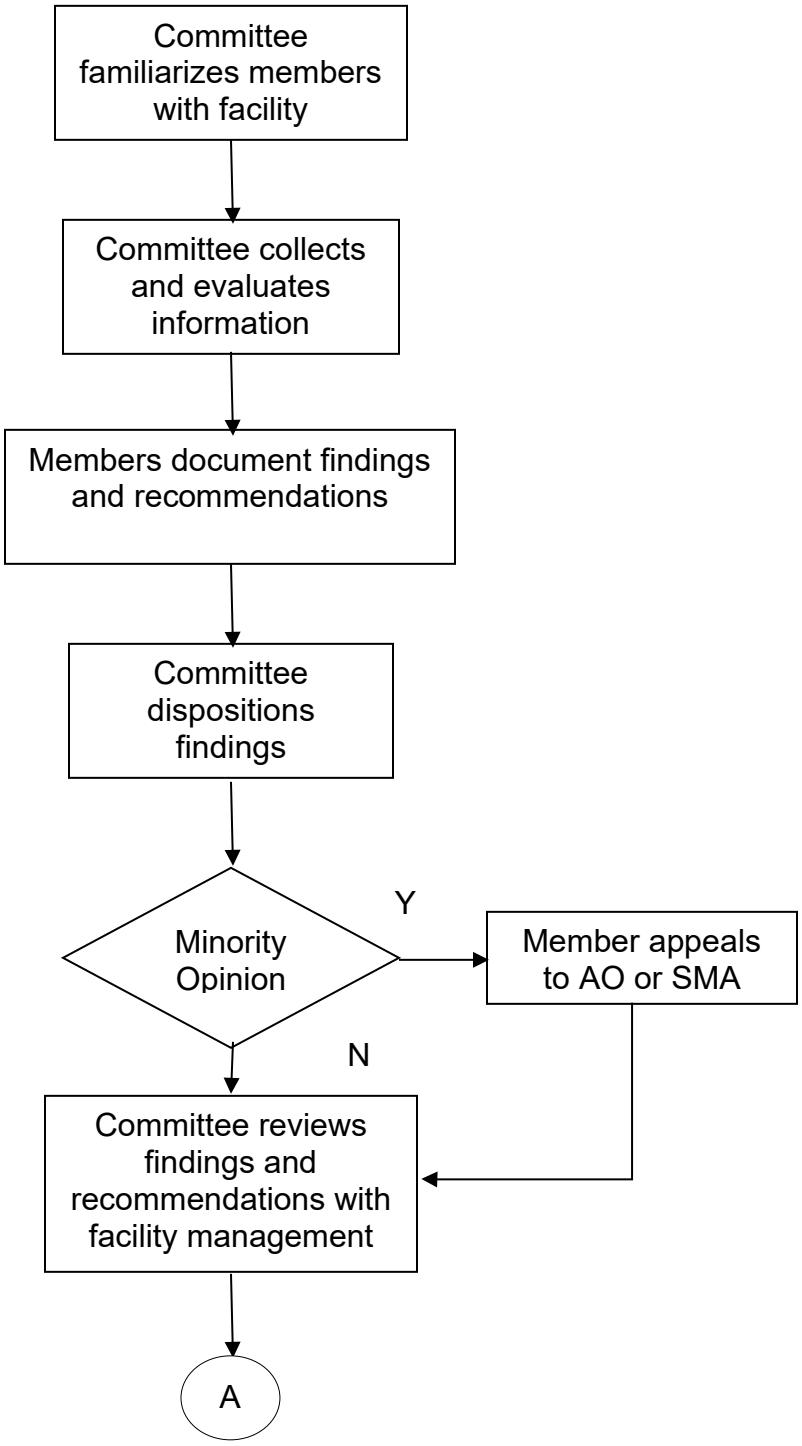
b. Closed bombs used for bridge wire verification tests, that require close proximity to personnel, shall be tested remotely prior to first use.

c. Before and after each series of tests, the volume shall be measured and compared with the configuration controlled volume.

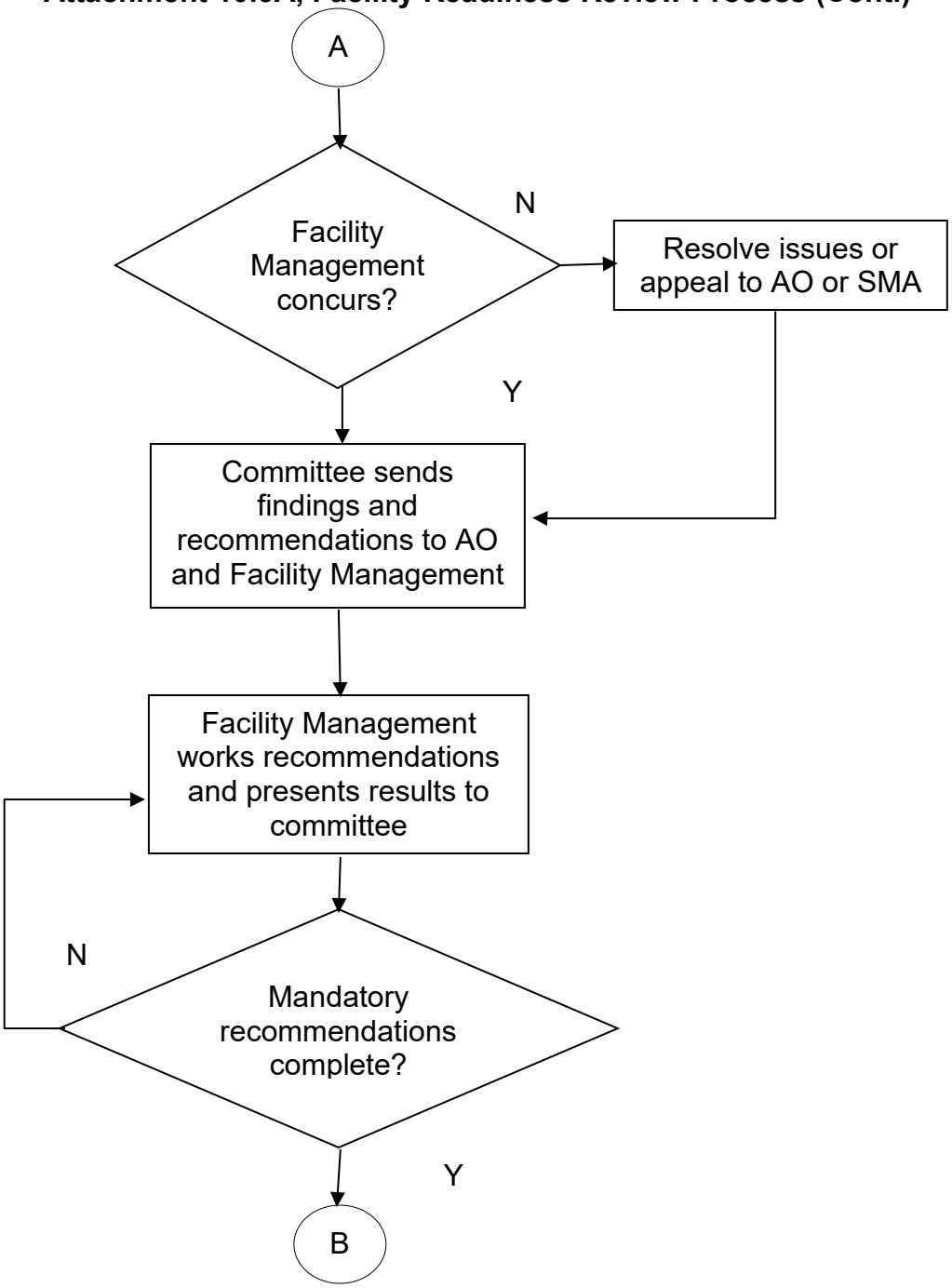
d. The allowable maximum volume shall be established for each bomb and noted on the configuration controlled sketch or drawing.

e. The bomb shall be cleaned and visually inspected after each firing.

Attachment 10.3A, Facility Readiness Review Process



Attachment 10.3A, Facility Readiness Review Process (Cont.)



Attachment 10.3A, Facility Readiness Review Process (Cont.)